What Works Clearinghouse
Study Design Classification

Revised September 2006

To be eligible for WWC review, a study must be a randomized controlled trial or a quasi-experiment. An eligible quasi-experiment must be one of the following three designs: quasi-experiment with equating on pretest, regression discontinuity design, or single-case design with multiple changes of condition. The questions and examples below are meant to help WWC staff to classify properly the design of each study potentially relevant to WWC review.[1]

Is this study a randomized controlled trial?

1. Was random assignment used to place participants into different study groups?

    - For studies received by the WWC prior to December 31, 2006: If the study authors used the term "random assignment" but gave no other indication of how the assignment procedure was carried out, the label is assumed to have been properly applied unless there is reason to doubt this claim.[2]

    - For studies received by the WWC beginning January 1, 2007: For the sample allocation to be considered "random assignment," the study authors must report specifics about the randomization procedure, including: (a) details about how the assignment sequence was generated (e.g., use of a random number table or generator, coin flip, roll of a die), (b) information about the role of the person who generated the sequence, and (c) methods used to conceal the sequence until participants were assigned to conditions.

    - Occasionally, researchers will use the term "random assignment" when they really mean "random selection." Alternatively, they may use the term "random selection" to mean "random assignment." Coders should examine closely the context of the language used in the report for evidence of these types of confusion.

    - Occasionally, researchers will use matching, blocking, or stratifying *before* randomization in order to minimize group differences on a variable or set of variables. Coders should closely examine studies to ensure that these are classified properly as randomized controlled trials.

[1] The WWC regularly updates WWC technical standards and their application to take account of new considerations brought forth by experts and users. Such changes may result in re-appraisals of studies and/or interventions previously reviewed and rated. Current WWC standards offer guidance for those planning or carrying out studies, not only in the design considerations but the analysis and reporting stages as well. WWC standards, however, may not pertain to every situation, context, or purpose of a study and will evolve.

[2] Reasons to doubt the claim of randomization include the following: (1) the assignment procedure was described and it resembles one of the strategies identified as "not functionally random" (see below) or (2) the sample sizes for the intervention and comparison conditions are markedly different at the level of assignment.

2. If a randomization procedure was not used, were participants placed into intervention groups using a process that was haphazard and functionally random?

    - Examples of haphazard assignment that *might* be functionally random include: (a) alternating by date of birth (e.g., January 5 is placed into group A, January 7 is placed into group B, and January 13 is placed into group A); (b) alternating alphabetically by last name (e.g., Acosta is placed into group A, and Aguilera is placed into group B); and (c) alternating by the last digit of an identification code (e.g., "evens" are placed into group A, and "odds" are placed into group B).

    - Examples of haphazard assignment that are *unlikely* to be functionally random include: (a) placing birth months January – June into group A, birth months July – December into group B; (b) placing participants with a last name beginning with A-M into group A, and last names beginning with N-Z into group B; (c) placing the first 20 arrivals into group A, and the last 20 arrivals into group B, and (d) using scheduling software to assign students to groups.[3]

    - Because it is often difficult to determine what is functionally random and what is not, the WWC's Principal Investigators (PIs) and Technical Review Team (TRT) should weigh in whenever this decision is not clear cut.

An answer of "yes" to either of these questions leads to a categorization of the study as a randomized controlled trial. If the categorization is based on haphazard assignment, it will be noted in the write-up of the intervention report.

Is this study a quasi-experiment with equating on pretest?

1. Were participants placed into different study groups on a non-random basis?

2. Were the groups equated on a pretest (or a proxy of the pretest) of the outcome measure and across any other characteristics identified in the WWC review protocol for each topic area?

[3] For the WWC to consider student assignment based on scheduling software functionally random, the study author would need to demonstrate that the assignment of students to conditions was independent of students' other interests and course selections. For example, class scheduling software might be used to produce random samples in these two situations: (1) The scheduling system is used with no pre-specified conditions (e.g., no classes or students with certain characteristics were entered into the system before other students were assigned to groups) OR (2) The sample was limited to students who were not affected by scheduling parameters or constraints (e.g., if gym, band, and art classes were already set in the scheduling system, the random assignment of students who did not take gym, band, or art classes may produce a functionally random sample).

- Equating can be accomplished through:

  — Matching. This involves creating or identifying intervention and comparison groups that "look" similar on a pretest of the outcome measure and across any other characteristics identified in the WWC Review Protocol for each topic area. Because adequate matching may not be easy to accomplish, the WWC's PIs and TRT should be consulted to determine whether the matching method used in a particular study resulted in adequate equating on pretest.

  — Statistical adjustment. This involves using statistical procedures (e.g., covariate adjustment in an ANCOVA) to equate groups on a pretest measure of the outcome.

- Timing of equating: Groups may be identified and matched before the intervention was implemented or prior to analysis after implementation. Groups may also be statistically equated during analysis.

- Timing of pretest: The pretest may be administered at baseline, or it may be administered quite some time before the intervention was implemented (e.g., collected from achievement testing the previous year).

- Sample pretested: Under limited conditions, the pretest used in equating may come from a preceding cohort of the students that comprise a larger unit of intervention delivery. For example, for interventions where the school is the unit of intervention delivery (e.g., a school-wide math curriculum), the pretest or "baseline" data may come from achievement testing at the school during the year that preceded the intervention's implementation. In this case, the pretest data would not come from the student cohort in the study sample, but from a different cohort of students who were in a given grade in the year before the intervention was implemented. Only when the unit of intervention delivery is at the school level or higher is this approach acceptable. The timing and characteristics of the pretest should be noted during coding.

If the answer to both of these questions is "yes," then the study meets the WWC's definition of a quasi-experiment with equating.